SEP 21 1995

| DIST | LTR | ENC |
|---|---|---|
| BORGMAN, K A | | |
| BUHL, T R | | |
| BURKHART, K M | | |
| CARD, R G | X | X |
| EVANS, B L | | |
| FENN, T M | | |
| FERRERA, D W | | |
| GRANT, B A | X | |
| HEALY, T J | | |
| HILL, J A | | |
| KELL, R E | | |
| MANI, V | | |
| MARTINEZ, L A | | |
| MCGOVERN, L J | | |
| MCKIBBIN, J G | | |
| OKEY, R | X | |
| O'BRIEN, G D | | |
| PANGERSIS, P A | | |
| RICHEY, C L | | |
| SANDLIN, N B | | |
| SHUMWAY, W K | | |
| TUOR, N R | | |
| TURNER, K A | | |
| VOORHEIS, G M | | |
| WALLER, C A | | |
| HEDAHL, T | X | X |
| HAHN, S | X | X |



tates Government

# morandum

**Department of Energy**
**Rocky Flats Field Office**

EP DFG 14105

Operable Unit 5 Draft Phase I RCRA Facility Investigation/Remedial Investigation Report Comments

Bob Card, Vice President
Environmental Restoration and Waste Management
Kaiser-Hill Company

Attached are the Department of Energy's (DOE's) comments on the Draft Phase I RCRA Facility Investigation/Remedial Investigation (RFI/RI) Report, Woman Creek Priority Drainage, Operable Unit (OU) 5 Major concerns are the Ecological Risk Assessment, which is forthcoming, but not included in this version of the draft report, a failure to present a comparison to Applicable or Relevant and Appropriate Requirements, and additional information on the Fate and Transport of Contaminants of Concern In addition, all available, up to date information should be included in the data analyses DOE requests that the attached comments be addressed and the Draft document modified accordingly, prior to submittal to the Regulatory Agencies

Kaiser-Hill only provided DOE two copies of the document therefore additional comments will also be forth coming over the next three weeks as reviews from other organizations are completed

This request is not intended to change the current scope, cost, or schedule for the Contractor For additional information or coordination, please contact Dave George at extension 5669

Jeffrey A Kerridge
for Jessie Roberson
Assistant Manager for
Environmental Programs

Attachment

cc w/Attachment
J Wienand, EP, RFFO
D George, EP, RFFO
T Hedahl, K-H
S Hahn, K-H
C Bicher, RMRS
Admin Record

**Comments on the**
**Draft Phase I RFI/RI Report**
**Women Creek Priority Drainage**
**Operable Unit No. 5**
**August 1995**

## MAJOR ISSUES/GENERAL COMMENTS

1 Much of the data are presented without an explanation as to WHY these data are important to the reader Consequently, much of the text does not present a cohesive picture of site contamination

2 Without the presence of TM 15, the RI report is hard to follow (especially Section 2 0) and the results are only presented in summary format even though the text states that the results are given in detail Suggest including more data/tables/figures from TM 15 into the RI or insert TM 15 in the Appendices to beef up the report

3 The document is not complete since the Ecological Risk Assessment (ERA) is not included at the time of this review The ERA is essential in providing a complete characterization of risk at the site Additionally, the OU 5 ERA is critical to the completeness of the OU 2 RI report

4 The amount of effort put into discussing the difference between pre- and post TM-15 reporting detection limits detracts from the overall integrity of the report The discussions, as presented in the report, suggest that the data are circumspect Unless the regulatory agencies have specifically asked for the discussion presented in Section 2 3, the entire section should be moved into Section 6 0 or even into a separate appendix as appropriate Different detection limits is a common sampling discrepancy and other OUs have dealt with this same problem without making such a big deal about it It may be sufficient to simply state that for non-detect values the higher detection limit was always chosen to ensure a conservative risk assessment value, thus avoiding casting doubt on the quality of results throughout the report Correct references to pre- and post- TM 15 data throughout the document as appropriate

5 A general comment received to date by the regulators on other HHRAs relates to incorporating all available data into the RI report Section 6 2 2 states that data from October 1992 to November 1993 were evaluated for the HHRA even though additional data are available The regulators have repeatedly asked that all data be included or the report will be considered incomplete For OU 5, this will require adding available data up to August 1995

6 Delete all references to Advanced Sciences, Inc (ASI) or EG&G/RMRS as authors of the document DOE is the author of the document

6 a The Assessment appears to be satisfactorily prepared and suitable for regulatory review No fatal flaws surfaced through this review and barring undetected errors or omissions, the Assessment should be acceptable to Region VIII and CDPHE The methods generally follow USEPA and CDPHE guidance, and seem to be consistent with the conventions used at Rocky Flats Several methodology shortcuts resulting in overly conservative estimations were taken which do not affect the findings, however, DOE should be mindful of their potential precedent setting nature and possibly make modifications

2

## SECTION SPECIFIC COMMENTS

### Executive Summary

7 The executive summary should not just repeat what the conclusion and recommendation section says verbatim It should be a separate summary of the entire document including such lists as the Chemicals of Concern, calculated human and ecological risks, etc Also, no mention is made of the Ecological Risk Assessment (ERA) results The results of the ERA are important in characterizing the OU as a whole

8 p ES-3, 3rd par , 4th sen The text is inconsistent concerning whether or not there were ten or eleven technical memoranda produced Correct as appropriate Also, in this paragraph suggest mentioning the use of the "observational approach" in determining which stages of investigation were completed

9 p ES-5, 1st par , last sen Suggest a table listing the Chemicals of Concern (COCs) here

10 p ES-5, last par Provide a summary discussion of the ecological risk receptors and pathways examined Also, in this paragraph suggest a table presenting a summary of the calculated risks from the HHRA and ERA inserted here

### Section 1 0 - Introduction

11 p 1-12, sec 1 3 1, 1st par , last sen Expand the discussion of Table 1-1 Were the objectives of the original OU 5 work plan met? Give a brief rationale either in the text or the table as to WHY the original IAG scope of work was altered (i e , original location not accessible, wells could not be developed, etc )

### Section 2 0 - OU 5 Field Operations and Investigations

**General**

12 Much of this section is repetitive To streamline the presentation of Section 2 0, much of the information should be moved and consolidated in Section 4 0, Nature and Extent When the summary results are presented, there is little discussion/interpretation of the significance of those results to the reader These discussions should be added to beef up the report

13 A figure showing the logic flow chart of the different stages of investigation (Stages 1 through 5) in the RI would significantly clarify the text discussion

14 A listing/presentation of the objectives of the RI as presented in OU 5 work plan and TM-15 would be appropriate in explaining why the work was conducted as presented in the report Furthermore, by listing the objectives of the various work plans, the reader is given an idea as to whether or not the RI is adequately meeting regulatory requirements

15 A discussion of previous and ongoing Ecological Investigations should be added to this section A brief history of how OU 5 was designated as the OU responsible for the Woman Creek watershed Ecological Risk Assessment may be appropriate here

**Specific**

16 p 2-2, last par , 3rd sen Clarify this idea Should this say something like "because non-detects are valued at 1/2 the detection limit the average concentration is higher" or is DOE telling the regulators that OU 5 contamination is really lower than presented? If so, this entire document may be false in its representation of the nature and extent of contamination at OU 5 and the associated risk is actually lower than presented

17 p 2-11, 3rd par Delete this paragraph Field instrumentation is not indicative of the potential air-pathway risk Moreover, the RI should not present field instrument data when laboratory analytical data is available and an HHRA has been performed that quantifies those laboratory data

18 sec 2 2 1 7 1, p 2-12 This section should be moved into Section 3 0 as part of characterization of the physical parameters of the IHSS and Section 5 0 as part of the input parameters in modeling tasks

19 sec 2 2 1 7 2, p 2-14 Same as comment no 18

20 p 2-14, Bullet list Delete those items not addressed in the RI report unless it somehow supports the discussion presented

21 p 2-15, 1st par , last sen Provide an explanation of why the Percent Change from Pre-TM 15 mean in Tables 2-3 through 2-5 is important Also, see General Comment No 1 and section 2 0 tables comments

22 p 2-17, 3rd par Reference to the pre- and post-TM-15 data is confusing See General Comment No 4

23 p 2-18, 3rd and 4th par Suggest moving these paragraphs to Section 3 O

24 p 2-21, Wind suspension Most of this discussion should be moved into either the air modeling section or an appendix, as appropriate

25 p 2-21, Wind resuspension, 1st par , 1st sen Delete the reference to future onsite resident since this exposure pathway was not assessed

26 p 2-47, Bullet listing of results Since Count per minutes (cpm) data are presented a brief discussion of how cpm correlate to picoCuries/gram (pCi/g) would strengthen this section Also, give a background activity level in cpm The only background value stated was in pCi/g

27 p 2-50 through 2-55, sec 2 3 Suggest moving this section into the HHRA or an appendix as appropriate See General Comment No 4

**Section 2 0 Tables**

28 2-3, 2-4, 2-7, 2-8, 2-9 Report the standard deviation associated with the mean value

29 2-6 It is unclear what substantive point the table is trying to convey This table may be more appropriate in an appendix

**Section 2 0, Figures**

30 2-2 The text states that the three different analyte plumes are delineated on this figure, however, there is no indication of what contaminants are present at which location from the figure Correct as appropriate

**Section 3 0 - Physical Characteristics of OU 5**

**Specific**
31 p 3-6 through 3-9, Hydrology Provide discussion about discharge rate in the Women Creek drainage When describing any surface water system discharge rate is a minimum measurement parameter used in its characterization (See Appendix A, p 12)

32 p 3-8, 2nd par , 1st sen This sentence is confusing Unclear if the average of the groundwater AND the average of the surface water elevations were used State what time of year the average elevations were calculated because of seasonal variation a reach may change its gaining/losing characteristic Also, did discharge data support the gaining/losing reach determinations

33 p 3-8, 3rd and 4th par There appear to be a discrepancy in the text about gaining and losing reaches between reaches 18-19 and 18-20 These reaches are listed as both gaining and losing reaches year round Correct as appropriate

34 p 3-14, sec 3 5 4 This section needs to expand the discussion of the hydrogeology Where in OU 5 are the recharge areas, what is the annual recharge rate, what is the direction of ground water flow, what do the high and low potentiometric surfaces look like, etc This section does not sufficiently address the topic of OU 5 hydrogeology

35 p 3-15, 3rd par , last sen Delete this sentence, it generalizes the statements made in the Hydrology section regarding gaining/losing reaches

36 p 3-34, 1st par , 2nd sen Expand the discussion of the hydrographs Simply listing the hydrographs is not an analysis of the data State what do the hydrographs mean to the OU 5 hydro system Do to the repetitive nature of the use of hydrographs, this comment applies to the other IHSS discussions

37 p 3-38, 3rd par , last sen The statement that " appears to have several bedrock lows that could potentially trap groundwater temporarily " is not substantiated by data in this discussion Delete this statement or expand the discussion of this statement Additionally, Figures 3-72, 3-28, and 3-29 should not show bedrock lows if there are no data to substantiate such an interpretation

38 p 3-39, sec 3 7 2 3 1, 1st par Provide an explanation of how the dry areas are acting as far as dewatering, preferential flow paths, etc Such mechanisms significantly affect fate and transport and remedial decisions

**Section 3 0, Tables**

39 No tables were presented in this section

**Section 3 0, Figures**

40 3-1 Call out the location of Antelope Spring

41 3-11 Call out the fault designations ( Fault 2, 3, 4, etc ) as stated in the text (see p 3-13)

42 3-21 This figure is so busy that much of the information is not decipherable

43 3-26, Legend What is a "Mini Well?" Define in this legend

44 3-27, 3-28, and 3-29 Either change the inferred interpretation of the bedrock lows shown on these figures or provide the well control/sampling points that substantiate this interpretation (see also comment no 37)

**Section 4 0 - Nature and Extent of Contamination**

45 p 4-5, 3rd par, 1st sen QA/QC evaluation results are more appropriate in an Appendix See Section 4 0, Tables, comment no 49

46 p 4-12, sec 4 3, bullet list Suggest presenting the COCs by media in a table

47 p 4-13, 1st par Figures 4-1A through 4-12 do not provide a succinct look at the nature and extent of contamination and should be revised The figures present a concentration range and do not show what the particular analyte is that exceeds the Background Mean plus so many standard deviations The reader is left with the task of matching up two figures (sample location and number map and the extent map) and the analyte concentration tables (Tables 4-27 through 4-37) to evaluate the actual extent of contamination by analyte and concentration Other RI reports have presented these data on one figure that calls out a box with the sample depth (if applicable), the analyte, and the concentration of that analyte (see OU 1 Final and OU 2 Draft RI reports)

48 p 4-14, sec 4 3 1 1, 1st par , last sen When referencing sample locations provide a reference to the figure where the reader can find that location also

**Section 4 0, Tables**

49 4-2 through 4-5 As per EPA *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, analytical data and QA/QC evaluation results are more appropriate in a QA/QC appendix

**Section 4 0, Figures**

50 No comments

**Section 5 0 - Fate and Transport**

**General**

51 In general, the document does not adequately present and discuss predicted results of fate and transport The fate and transport section does not adequately focus on the results of the modeling efforts for both the ground water contaminant transport modeling, and the surface water modeling efforts It is suggested that detailed discussions regarding the specific methodologies employed by the modeling effort (such as calibration criteria, boundary conditions, steps in calibration, etc be put in the modeling appendix and referenced It is then suggested that results of the modeling be thoroughly presented and discussed in relation to expectations, realism, conservatism of the model, etc Discussions of results and potential conclusions are not developed and clearly presented

6

52 The fate and transport section of the RI report should highlight the potential for COCs from identified source areas to transport through media or to specific outfalls or receptors The section should describe how specific site factors can affect transport mechanisms and the potential for future transport of COCs For example, how do the specific geochemical, geohydrologic and hydrologic conditions at OU 5 affect advective transport, sorption, dispersion, complexing, degradation, etc of the particular COCs for each source area and for each media Section 5 1 is far too general to adequately describe potential transport mechanisms and their potential relation to OU 5 It is suggested that specific site factors be discussed and their potential relationship to COC transport be presented prior to presenting discussions regarding modeling For example, how can organic carbon content, clay content, sesquioxide content, redox potential, pH, etc at OU 5 potentially affect transport mechanisms for the specific COCs and source areas? How do the transient flow conditions and the low K hydraulic conditions at OU 5 potentially affect the transport mechanisms? These discussions appropriately set up discussions and results of the modeling effort The modeling discussion alone does not adequately present this information to the reader

53 Section 5 3 1 4 3 Model Boundaries Although the hydraulic conductivity of the LHSU is low, there is (usually) hydraulic contact between the Upper and Lower units, suggesting that a quasi-3D model could have been made rather than making the bedrock contact a no-flow boundary It is suggested that you present and discuss the differences in K between the Upper and LHSU in order to document your decision to stick with a 2-D model Generally, a rule of thumb is that if 2 orders of magnitude in K separate units than a 3rd vertical dimension can usually be ignored This is important in order to document that a vertical pathway between these units is not significant

54 Given the highly transient conditions of ground water at OU 5 and Rocky Flats in general, your decision to create and calibrate your ground water model based on steady state conditions needs to be more thoroughly discussed and defended The ground water model was calibrated to only 7 alluvial wells primarily because these were the only wells with perennial water in them The adequacy of the ground water model in describing the actual conceptual model at OU 5 needs to be evaluated, defended and better discussed? This is important because the actual transient and variable geohydrologic conditions at OU 5 will greatly affect transport mechanisms for COCs From the discussion presented, it is questionable if the ground water model adequately represents the geohydrologic and contaminant transport mechanisms at OU 5

55 Section 5 3 1 5 1 COCs in Groundwater. The screening methodology employed screened out plutonium, uranium, beryllium, americium, and other COCs from the contaminant transport modeling effort, leaving only manganese, barium, and radium which are questionable real contaminants The purpose of the contaminant transport modeling program should be to predict, if possible, the potential future extent of the contaminants coming from the source areas Your calibration procedure effectively screened out the most important contaminants of interest If the model is not useful in making these predictions, then that must be discussed in relation to what might be expected under reasonable assumptions The information of 5-12 and 5-13 does not adequately present and discuss results of the ground water modeling program to the reader and adds little value to a Feasibility Study

**Section 6 0 - Human Health Risk Assessment**

56 Section 6 1 4 AOCs AOCs as used at Rocky Flats are unique Suggest a Citation of the CHPHE/EPA protocol

57 Section 6 2 Chemicals of Concern No mention of "waste-related" considerations and scant professional judgment to "stop and think" about the plausibility of the protocol results sets a compromising precedent The COC selection process does not affect the outcome However, if concentrations were higher and/or residential exposure scenarios were applied, the acceptance as COCs questionable native compounds such as antimony, mercury, and zinc could be result in an assessment where naturally occurring compounds suggest misleading risks

If Jim Whiting's data is available, it should be incorporated, at least through simple qualitative comparison

It is hard to believe that $^{226}Ra$ is actually a groundwater contaminant (3 3 pCi/l, reported in Hem, 1989, Rocky Flats never processed ores, where would it come from?) Also, solubility limits preclude $^{239}Pu$ ($pK_{sp}$ up to 55, Lange's Handbook, 1992, no history of large-scale $^{239}Pu$ disposal at OU 5) from being in solution at levels giving significant risk Table 6-9 notes that the most conservative course was taken in this step

58 6 2 5 Essential Nutrients Was current Region VIII guidance used? We have COCs including Mg, Zn, Cu, Mn, that could be assessed and possibly eliminated using Region VIII's approach Again, low concentrations and/or no residential exposure scenario makes this more of a method issue than a compelling oversight

59 6 2 7 Concentration/Toxicity Screen The con/tox screen has fallen from favor lately because of it soft technical underpinnings and zero-sums configuration (something will always be a COC) Most regions and States use a benchmark comparison such as the Rocky Flats PRGs or Region III Screening Concentrations at this step It is suggested that 1) this be acknowledged (softly) and, 2) a strong citation from a meeting or TM be used to mollify potential criticism here

60 6 3 Scenario and Pathway Identification As indicated above, the omission of a residential exposure scenario is critical to the no unacceptable risk finding It is suggested that this Section be buttressed by citations of meetings, TM's and other applications (e g , RMA) where similar scenarios have been accepted

61 6 4 Exposure Assessment Using maximum concentrations when the data set is greater than three samples is ominous from a precedent standpoint It is suggested that further evaluation and professional judgment be applied to avoid using maximums Quartile and/or percentile estimates (such as the 90th percentile) could be readily developed and inserted into the spreadsheets, spreadsheets reprinted and spot text adjustments made in a matter of days Once again, this won't affect the finding, but will avoid the precedent of using worst-case default methods which could produce different results in a dissimilar scenario

62 6 4 2 Exposure Factors Do the water and sediment contact and duration rates reflect Woman Creek and SID specific weather conditions (e g , days of temperature < 32°, snow, rain, etc)? Suggest this be considered

63 6 4 2 5 External Exposure Is this equation exposure and duration specific/ EPA's external dose slope factor considers 24 hour/day and 365 day/year exposure This could be important since external gamma turns out to be a key exposure pathway Please check

8

64 6 4 3 Intakes Please note that the supporting Tables show radionuclide intakes in units of mg/kg-day

1) If this is a presentation oversight, please correct with a footnote

2) If risks are computed from this basis, there is a systemic problem with the remainder of the report and possibly the findings

Please follow up

65 Section 6 6 2 There is an inappropriate risk summation throughout this Section Radionuclide risks are added to chemical risks Although it doesn't affect the outcome, radionuclide slope factors are reasonable maximum estimates (RME) while chemical slope factors are misbegotten upper-bound estimates Basically apples and oranges mathematically They should be computed and presented separately

Why were no traditional dose equivalent computations done and presented? DOE receives a major risk management benefit by considering the more widely accepted effective dose equivalent approach that is discussed in RAGS (Chapter 10) These computations would likely illustrate no unacceptable doses (like the findings show no unacceptable risk), however, there may be other circumstances where DOE's appeal to the dose equivalent approach (and historical use and acceptance including OU 5) could be very useful

Similar comment, Why was not RESRAD run? It is actually a preferable exposure assessment tool that uses current dose conversion factor and incorporates decay products such as $^{222}Rn$ from the uranium series DOE Order 5400 5 requires its' use to evaluate free-release of soils containing radionuclides

66 6 6 3 Uncertainty Risk less than 1E-4 does not preclude the need to address uncertainties A very major bias and overestimate of risk stems from the CDPHE AOC approach It effectively segregates out and drives high concentrations through the exposure equations Given the large expanse of OU 5, it seems that about 15% or less is affected and this serves as the basis for computation Are not current and future use receptors also exposed to the other 85% of the site that is not affected (e g , no exposure to contaminants), and won't future receptors' exposure be highly modified by structures, pavement, sodden areas etc ?

In the uncertainty section, as a minimum, one should strive to illustrate the highly biased and conservative nature of this assessment If probabilistic considerations were taken into account, the future risk would likely be 100 times lower than the estimates shown on Table 6-142 and HI's on Table 6-143

67 Risk Characterization The assessment would benefit from a risk characterization discussion that emphasized the findings in perspective As a minimum, computed risks could be compared to the 1E-4 to 1E-6 range and the HI's could be compared to the 1 0 benchmark, both are cited in the NCP Additional comparisons often used to give the reader some perspective include

- The background cancer incidence in Colorado of about 0 25
- The added risk attributable from OU 5 exposure 3E-5 + 0 25 = 0 25003, (about a 0 01% increase)

- EDE's (had they been computed) compared to naturally occurring doses (about 3 rem per year)
- EDE's compared to Standards and Guidelines such as the NCRP's recommended 100 mrem/year

RFO F 1321.2
(8/92)

U S DEPARTMENT OF ENERGY
ROCKY FLATS OFFICE

# RF REVIEW COMMENT RECORD



2 Document Reviewed (Title Number Revision and Date)
DRAFT PHASE I RFI/RI REPORT, WOMAN CREEK PRIORITY DRAINAGE, OU 5, August, 1995

3 Reviewer
Signature and Date JAS/8-29-95
Organization ERPT/AMPME
Location and Phone No T 130 I, X9735 (JAS)

4 Agreement with dispositions
Date
Reviewer
Document Preparer

| 5 Comment No | 6 Comment Type | 7 Comments (include suggested changes) | 8 Disposition |
|---|---|---|---|
| 1 | S | The use of fence diagrams should be considered as a means of enhancing the understanding of the hydrogeologic regime as presented in Chapter 3 0 | |
| 2 | E | The South Interceptor Ditch (SID) plays a major role in the surface water regime of OU 5, especially influencing the spread of contamination A better description of the SID is needed, in the Executive Summary, the SID is described as diverting all runoff from the south side of the Rocky Flats Industrial Area (p ES-3) However, Figure 1-2 does not clearly show the SID, it appears that the industrial area runoff may reach Woman Creek in the western extremity of the SID, but the terminus of the SID is not shown The SID is identified in later chapters as playing a significant role in limiting the spread of contamination and should be fully described to the reader to make the arguments for its value more persuasive | |
| 3 | S | The forms of metal constituents detected in soils and sediments are important to the assessment of whether releases are occuring or threatened In particular, mercury present in sediments would be quite mobile and more toxic if in an organic form and its mobility could impact the type and extent of remediation required For example, would sediments or soils need to be removed as opposed to closure in place or leaving the sediments unremediated if re-mobilization of organic forms were considered The issue of metals mobility and toxicity variations with form should be addressed in the selection of COC's in Chapter 4 0, the assessment of fate and transport mechanisms in 5 0, the human health risk assessment in 6 0, and in the ecological risk assessment that is in preparation | |

Comment Type
E—Essential comment (agreement must be documented for other than verbatim incorporation) S—Suggested comment NON-C—Nonconcurrence, based upon the following comment

11

RFO F 1321 2
(8/92)

U S DEPARTMENT OF ENERGY
ROCKY FLATS OFFICE

# RF REVIEW COMMENT RECORD

Page 2 of 4

2 Document Reviewed (Title Number Revision and Date)
DRAFT PHASE I RFI/RI REPORT, WOMAN CREEK PRIORITY DRAINAGE, OU 5, August, 1995

3 Reviewer
Signature and Date JAS/8-29-95
Organization ERPT/AMPME
Location and Phone No T 130 I, X9735 (JAS)

4 Agreement with dispositions
Date
Reviewer
Document Preparer

| 5 Comment No | 6 Comment Type | 7 Comments (include suggested changes) | 8 Disposition |
|---|---|---|---|
| 4 | S | Cation/anion balances should be performed using all ions with concentrations exceeding 1 0 mg/l to aid in identifying and tracking contaminant plumes in ground water Per an article in Ground Water by Stanley Davis, "Where are the Rest of the Analyses", there are numerous uses for ion balances and comparing of ion balances between sampling locations, including 1) plume definition and development (e g , identification of indicator chemicals at or ahead of the leading edge of hazardous constituent plumes), 2) origin if ground water (fingerprinting with major chemical relationships), 3) mixing in wells (use of sequential sampling and field measurements may help identify wells with cross aquifer screen placements), 4) anthropogenic vs naturally-occuring constituents (analyses of major constituents can identify unique chemical make-ups such as sodium sulfate-dominated ion balances which are often indicative of contamination by waste discharges), 5) check reliability of analysis (waters that do not show a close ion balance may have poor quality chemical analyses), 6) ions missing from analysis (lack of cation-anion balance may indicate the presence of an unusual constituent not analyzed), and 7) health hazards (high dissolved solids concentrations can present health problems) | |
| 5 | S | In Chapter 5, the discussion of Chemical Fate and Transport should include consideration of the effects that volatile organic compound (VOC) density both in water and vapor form can have upon contaminant transport The contaminant transport modeling does not appear to have accounted for density differences, so the density information should be used in interpretation of the modeling results | |

Comment Type
E—Essential comment (agreement must be documented for other than verbatim incorporation) S—Suggested comment NON-C—Nonconcurrence, based upon the following comment

12

RFO F 1321 2
(8/92)

U S DEPARTMENT OF ENERGY
ROCKY FLATS OFFICE

# RF REVIEW COMMENT RECORD



2 Document Reviewed (Title, Number Revision and Date)
DRAFT PHASE I RFI/RI REPORT, WOMAN CREEK PRIORITY DRAINAGE, OU 5, August, 1995

3 Reviewer
Signature and Date JAS/8-30-95
Organization ERPT/AMPME
Location and Phone No T 130 I, X9735 (JAS)

4 Agreement with dispositions
Date
Reviewer
Document Preparer

| 5 Comment No | 6 Comment Type | 7 Comments (include suggested changes) | 8 Disposition |
|---|---|---|---|
| 6 | S | Human Health Risk Assessment, Section 6 7 Risk Assessment Summary Throughout the summary, maximum total estimated risk values listed for the Areas of Contamination should be identified as to whether they refer to RME carcinogenic or non-carcinogenic risks | |
| 7 | S | Chapter 8, Preliminary Evaluation of Remedial Alternatives This chapter has no substantive content EPA guidance (OSWER Directive 9355 3-01, October, 1988) indicates that remedial action objectives should be revisited after RI data collection and analysis and that a range of alternatives should be identified which address the viable objectives Part of the data gaps evaluation then should involve identification of those data gaps which may prevent the later thorough analysis of the alternatives in the detailed FS In the case of OU 5, where our Human Health Risk Assessment has indicated that no remedial action may be necessary (pending the outcome of the Ecological Risk Assessment), this evaluation of remedial objectives and alternatives is particularly important in laying the groundwork for a No Action determination | |
| 8 | S | Chapter 9, Preliminary Identification of Data Gaps If any viable remedial action objectives, types of remedial actions and technologies are identified, then the data gaps discussion should address them and identify any data that ought to be collected in Phase II RFI/RI to allow full evaluation and development of the CMS/FS This would also apply to the No Action alternative in the event that it will be selected, from the standpoint that additional data may be needed in some IHSS's to demonstrate that contamination levels are insufficient to warrant remediation | |

Comment Type
E—Essential comment (agreement must be documented for other than verbatim incorporation) S—Suggested comment NON-C—Nonconcurrence based upon the following comment

13

RFO F 1321.2
(8/92)

U S DEPARTMENT OF ENERGY
ROCKY FLATS OFFICE

# RF REVIEW COMMENT RECORD



2 Document Reviewed (Title, Number Revision and Date)
DRAFT PHASE I RFI/RI REPORT, WOMAN CREEK PRIORITY DRAINAGE, OU 5, August, 1995

3 Reviewer
Signature and Date JAS/8-29-95
Organization ERPT/AMPME
Location and Phone No T 130 I, X9735 (JAS)

4 Agreement with dispositions
Date
Reviewer
Document Preparer

| 5 Comment No | 6 Comment Type | 7 Comments (include suggested changes) | 8 Disposition |
|---|---|---|---|
| 9 | E | Per the CERCLA RI/FS Guidance (OSWER Directive 9355 3-01, October, 1988), chemical-specific and location-specific ARAR's must be presented Particularly in the case of ground water, in view of its omission from the baseline risk assessment, ARAR's should be discussed to indicate whether an ARAR's waiver will be needed | |
| 10 | E | Section 10 2 Recommendations Referring back to Comment No 2, if the SID plays a major role in limiting the spread of contamination associated with OU 5, then its tendency to create a sink for contaminants that are mobilized in the surface water runoff upgradient must be considered The possibility that it constitutes or may in the future constitute a secondary contamination source in the ground water down-gradient of the SID must be addressed to support the determination that remediation is not necessary in OU 5 | |

Comment Type
E—Essential comment (agreement must be documented for other than verbatim incorporation) S—Suggested comment NON-C—Nonconcurrence based upon the following comment

14/14